Space Weather Forecast

Issued on Wednesday, 20 September 2023 at 13:07 Local

This forecast provides a four day assessment of space weather events. The probabilities stated below are for reaching or exceeding the given levels. For more information about space weather impacts please see the Met Office Space Weather Scales https://www.metoffice.gov.uk/weather/learn-about/space-weather/uk-scales

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Space Weather Forecast Headline: Chance of further minor geomagnetic storms throughout, except perhaps Day 2 (21 Sep). Isolated R1-R2 Minor/Moderate Radio Blackouts likely throughout.

Analysis of Space Weather Activity over past 24 hours

Solar Activity: Solar activity is Moderate. The peak Moderate class flare peaking at 19/2014 UTC, from the largest region located in the northeast. Twelve sunspot regions cover the visible disc, with nine numbered. Most of the regions are relatively stable with little overall change observed. A CME from a flare that departed the sun towards the southeast on 19 Sep. may give a glancing blow to Earth early on 23 Sep.

Solar Wind / Geomagnetic Activity: Solar winds remained at elevated levels for much of the 24 hour period, with a peak to strong levels around 650km/s in the middle part of the period. The total magnetic field was weak to moderate. The important north-south component remained at weak levels throughout. Geomagnetic activity was Unsettled to Active peaking at Moderate geomagnetic storm, in the 19/1200-1500 UTC interval, with an overall downward trend noted.

Energetic Particles / Solar Radiation: No solar radiation storms were observed.

Four-Day Space Weather Forecast Summary

Solar Activity: Solar activity is forecast to be Low to Moderate, with further isolated Moderate flares likely each day of the forecast period.

Solar Wind / Geomagnetic Activity: Solar winds at elevated levels for the remainder of Day 1 (20 Sep), increasingly easing into Day 2 (21 Sep). Fast wind influence likely through the period, especially on Day 3 (22 Sep) .Unsettled to Active geomagnetic activity, with a continued chance of further Minor storms. CME effects likely easing into Day 2-3 (21-22 Sep) with generally Quiet to Unsettled conditions returning. Into late Day 3 and Day 4 (23 Sep). Active to minor storm geomagnetic storm activity may return at times, perhaps more especially on Days 3 and 4 (22 and 23 Sep).

Energetic Particles / Solar Radiation: No solar radiation storms are expected, with only a slight chance of an enhancement should any larger flares occur, or perhaps early in the period in association with CME arrival.

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Geomagnetic Storms:

Geo-Magnetic Storm Probability (Exceedance)	Level	Past 24 Hours (Yes/No)	Day 1 (00-24 UTC) (%)	Day 2 (00-24 UTC) (%)	Day 3 (00-24 UTC) (%)	Day 4 (00-24 UTC) (%)
Minor or Moderate	G1 to G2	Yes	30	10	40	30
Strong	G3	No	1	1	10	1
Severe	G4	No	1	1	1	1
Extreme	G5	No	1	1	1	1

Radio Blackouts - X Ray Flares:

X Ray Flares Probability	Level	Past 24 Hours (Yes/No)	Day 1 (00-24 UTC) (%)	Day 2 (00-24 UTC) (%)	Day 3 (00-24 UTC) (%)	Day 4 (00-24 UTC) (%)
Active	R1-R2 M Class	Yes	60	60	60	60
Very Active	R3 to R5 X	No	5	5	5	5

Solar Radiation Storms - (High Energy Protons):

Radiation Storms Probability (Exceedance)	Level (cm^{-2} sr^{-1} s^{-1})	Past 24 Hours (Yes/No)	Day 1 (00-24 UTC) (%)	Day 2 (00-24 UTC) (%)	Day 3 (00-24 UTC) (%)	Day 4 (00-24 UTC) (%)
Active	≥ S1	No	10	5	5	5
Very Active	≥ S3 *	No	1	1	1	1

* S3 ≥ 10 MeV ≥ 1000 pfu and / or ≥ 50 MeV ≥ 10 pfu. (pfu = $cm^{-2}sr^{-1}s^{-1}$)

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